PROC. BIOL. SOC. WASH.
98(4), 1985, pp. 949–953

ISOCHAETIDES COLUMBIENSIS, NEW SPECIES (OLIGOCHAETA: TUBIFICIDAE) FROM THE COLUMBIA RIVER, OREGON

Ralph O. Brinkhurst and Robert J. Diaz

Abstract.—*Isochaetides columbiensis,* new species, is unique in the possession of highly modified chaetae in segment II but otherwise resembles other members of the genus in terms of the form of the male ducts and the possession of modified spermathecal chaetae.

In July 1976 a plant propagation program was begun at the Miller Sands habitat development site in the Columbia River Estuary (Clairain et al. 1978). A benthic biological study was undertaken in August 1980 to monitor the development of the benthic community at this site. The taxonomy of the oligochaetes obtained during the study was determined. The collection from one of the natural reference marshes studied contained a number of interesting species, and among them was a new species of the genus *Isochaetides,* described here.

Materials and Methods

Samples were obtained in the field by hand digging a 0.05 m^2 by 10 cm deep area and screening the sediment through a 500 μm sieve. Worms were preserved in formalin with rose bengal stain and were subsequently whole-mounted in Canada Balsam. All of the specimens of the new species were found in samples from Snag Island in the Lewis and Clark National Wildlife Refuge.

The type-series of the new species is deposited at the U.S. National Museum (USNM), Smithsonian Institution, Washington, D.C.

Isochaetides columbiensis, new species
Figs. 1, 2

Holotype.—USNM 097961, whole-mounted specimen in Canada Balsam.

Type-locality.—Snag Island, Columbia River Estuary, Oregon, mid-tide level, Aug 1980, coll. U.S. Army Corps of Engineers staff; 123°37′30″W, 48°15′00″N.

Paratypes.—USNM 097962–097969, 8 specimens whole-mounted on 8 slides, 1 specimen with head and tail whole-mounted on one slide, genital region sectioned on another; ROB collection, 4 specimens whole-mounted on one slide and one dissected specimen; RJD collection, 3 specimens whole-mounted on one slide.

Etymology.—*Columbiensis* refers to the Columbia River system from which the new species was found.

Description.—Worms fragmented, longest fragment 10 × 0.25 mm, 38 segments. Anterior end bluntly rounded with small prostomium; eversible pharynx large, apparently with a spherical diverticulum when inverted, which forms the external mouth when pharynx everted (Fig. 1). All chaetae bifid, no hair chaetae present.

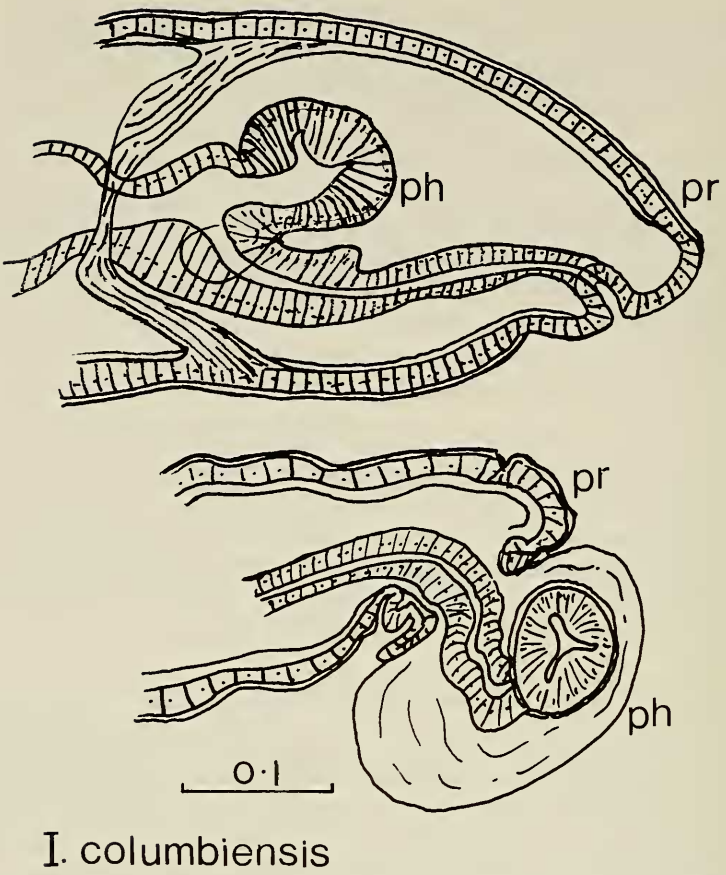

Fig. 1. *Isochaetides columbiensis,* pharynx, everted and retracted condition. ph = pharynx, pr = prostomium.

Chaetae of II, 2–4 per bundle with reduced upper teeth and strongly recurved, thick lower teeth (Fig. 2). In other anterior segments, at first 2 but increasing to mostly 4 and up to 6 chaetae per bundle with upper teeth as thick as but much longer than lower, by VII, teeth approach equal length, but in VIII–IX upper tooth shorter than lower. Ventral bundles of X with single large spermathecal chaetae with large glands.

Postclitellar bundles with 3 chaetae with short upper teeth and recurved lower teeth, these not reaching extreme form of those in II. All somatic chaetal bundles accompanied by small chaetal glands. Spermathecae spherical with short, narrow ducts, spermatozeugmata short and broad. Spermathecal pores beside spermathecal chaetae. Length of vas deferens not observed. Atria appear to be simple widenings of vasa deferentia, with prostates attached near midpoints, ejaculatory ducts quite short and entering small penial bulbs apically (Fig. 2). Penes bearing small penis sheaths.

Habitat.—Tidal freshwater marsh, with oligochaetes 93% of the fauna, sediments 56% mud, volatile solids 4.3%, tidal range 1.9 m.

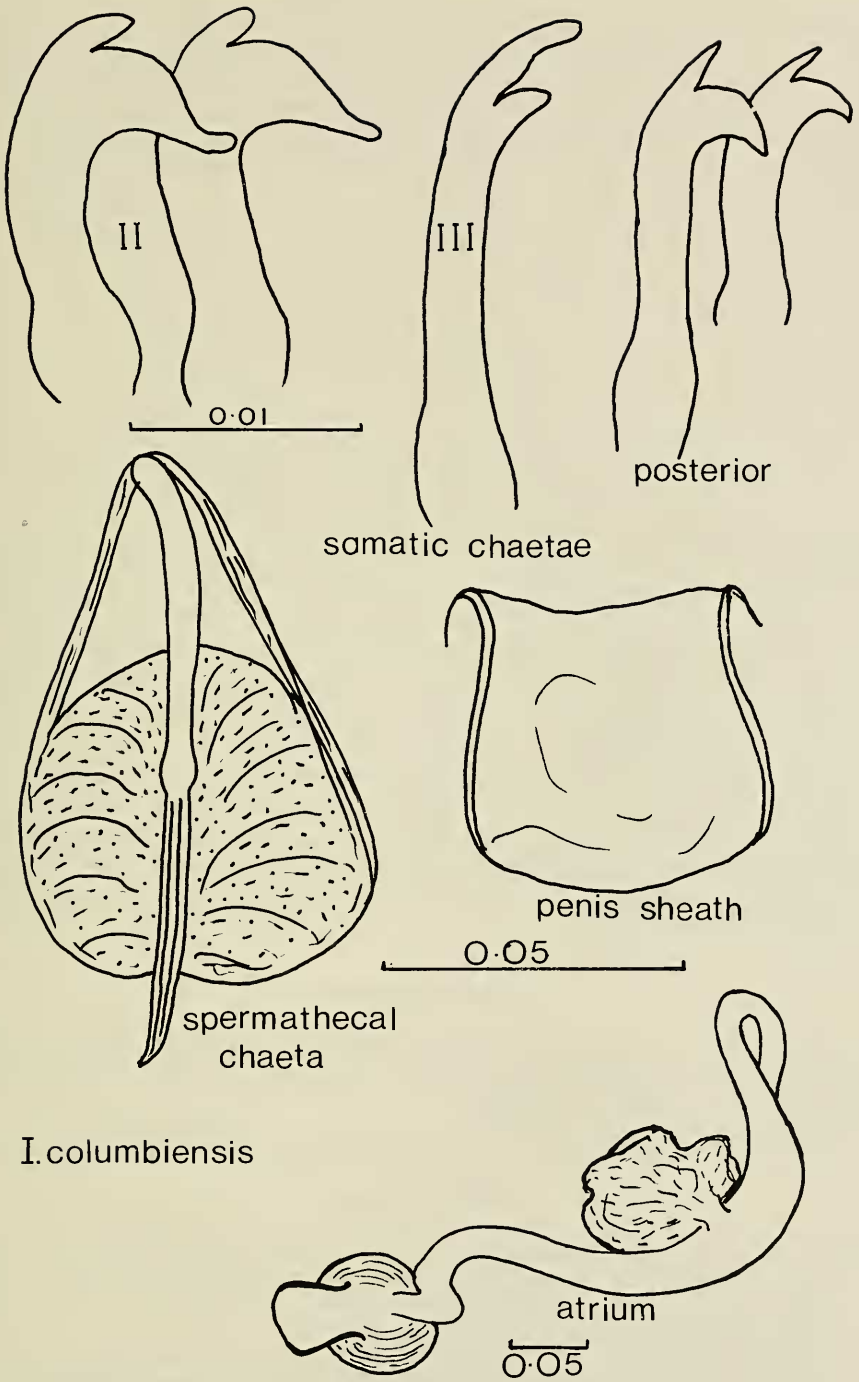

Fig. 2. *Isochaetides columbiensis,* chaetae, male duct and penis sheath.

Distribution.—Known only from the type-locality.

Remarks.—The genus *Isochaetides* was emended by Brinkhurst (1981) and now contains a number of taxa, mostly poorly known, that have modified spermathecal chaetae, bifid somatic chaetae, and penis sheaths that are thin if present. The type-species occurs in Lake Baikal, and a recent redescription (Brinkhurst 1984) suggests that the atria more strongly resemble those of *Tubifex* than had been considered previously, as the vas deferens can now be seen as much narrower than the atrium at the point of union between the two. A similar situation may exist in the holotype of this species, but it is difficult to observe the vas deferens and in the paratype (Fig. 2) the vas deferens appears to taper slowly into the atrium. It is possible that the amount of prostatic secretion present in the upper atrial lining could account for the apparent difference, but as all the material in question consists of mated specimens this seems unlikely. The genus as now constituted is widespread, with another Lake Baikal species and others from Asia, South America and North America and Europe. This new species approaches *I. curvisetosus* and *Aulodrilus paucichaeta* (recently described by Brinkhurst and Barbour 1985), but the modified chaetae of II in the new species and the form of the penis sheath are both diagnostic. The atria of *I. curvisetosus* are probably more like those illustrated here for the new species than they are like the illustration in the original and revised descriptions of *I. curvisetosus* (see Loden 1978). The latter are accurate renditions of what can be seen on the dissected holotype of *I. curvisetosus,* but the ejaculatory duct appears to have been stretched in the process of the dissection and appears too narrow according to new evidence from fresh material (M. S. Loden and W. T. Wassel, pers. comm.).

The fauna at this site is interesting in that three unusual western tubificid species were found (*Limnodrilus silvani, Telmatodrilus vejdovskyi,* and *Varichaetadrilus pacificus*) together with other usual forms (*Bothrioneurum vejdovskyanum, Limnodrilus udekemianus, L. hoffmeisteri,* a *Rhyacodrilus* and a *Spirosperma* species). Non-oligochaete community dominants were chironomid larvae, *Corbicula fluminea,* and saphaerid larvae.

Acknowledgments

We are indebted to John Lunz, Buddy Clairain, and Charles Newling of the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS for permission to publish this report.

This paper is Contribution No. 1240 of the Virginia Institute of Marine Sciences.

Literature Cited

Brinkhurst, R. O. 1981. A contribution to the taxonomy of the Tubificidae (Oligochaeta: Tubificidae).—Proceedings of the Biological Society of Washington 94:1048–1067.

———. 1984. A revision of the Tubificidae and Lycodrilidae (Annelida, Oligochaeta) known from Lake Baikal.—Canadian Journal of Zoology 62:494–509.

———, and M. T. Barbour. 1985. A new species of *Aulodrilus* Bretscher (Oligochaeta, Tubificidae) from North America.—Proceedings of the Biological Society of Washington 98:931–934.

Clairain, E. J., R. A. Cole, R. J. Diaz, A. W. Ford, R. T. Huffman, L. J. Hunt, and B. R. Wells. 1978. Habitat development field investigations Miller Sands marsh and upland habitat development site, Columbia River, Oregon.—Summary Report.—Dredged Material Research Programme Technical Report D-77-38:1–72.

Loden, M. S. 1978. A revision of the genus *Psammoryctides* (Oligochaeta: Tubificidae) in North America.—Proceedings of the Biological Society of Washington 91:74–84.

(ROB) Ocean Ecology Laboratory, Institute of Ocean Sciences, P.O. Box 6000, Sidney, British Columbia V8L 4B2, Canada; (RJD) Virginia Institute of Marine Science, School of Marine Science, College of William and Mary, Gloucester Point, Virginia 23062.